Inventors: Toshiko Makimoto, et al. Docket No.: 14321.63
NEW SHEET

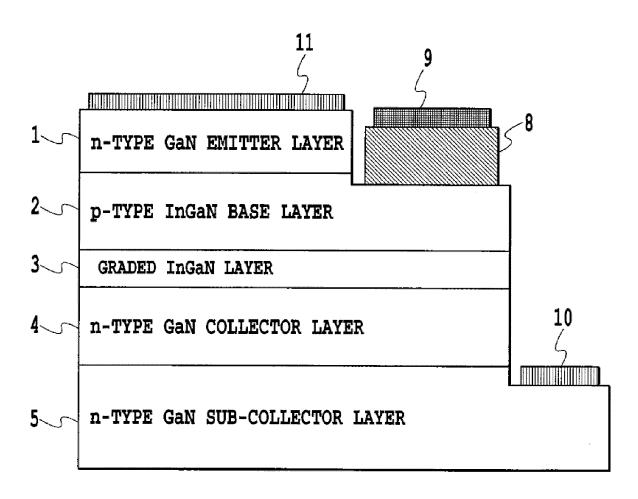


FIG. 1

Application Number: 10/516,380 Inventors: Toshiko Makimoto, et al. Docket Docket No.: 14321.63 **NEW SHEET**

1	n-TYPE GaN EMITTER LAYER (Si:5x10 ¹⁹ cm ⁻³ ,40nm)
2	p-TYPE InGaN BASE LAYER (ln:7%,Mg:1x10 ¹⁹ cm ⁻³ ,100nm)
3	GRADED InGAN LAYER(30nm)
4	n-TYPE GaN COLLECTOR LAYER (Si:1x10 ¹⁷ cm ⁻³ ,500nm)
5 \	n-TYPE GaN SUB-COLLECTOR LAYER (1μm)
6	Aln buffer LAYER(100nm)
75	SiC SUBSTRATE

FIG. 2

Inventors: Toshiko Makimoto, et al. Docket No.: 14321.63

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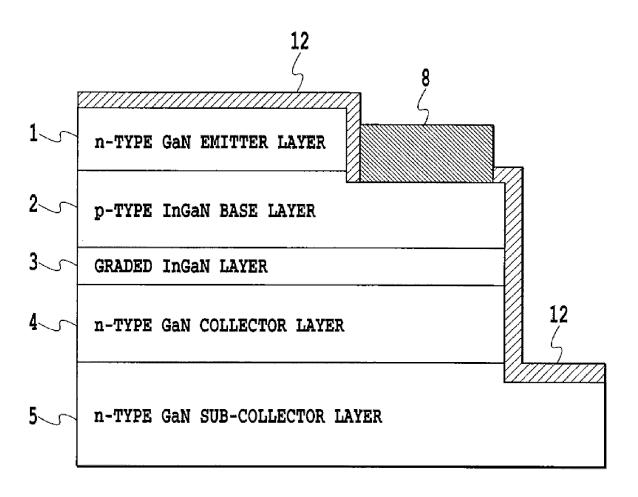


FIG. 3

Application Number: 10/516,380 Inventors: Toshiko Makimoto, et al. Docket NEW SHEET Docket No.: 14321.63

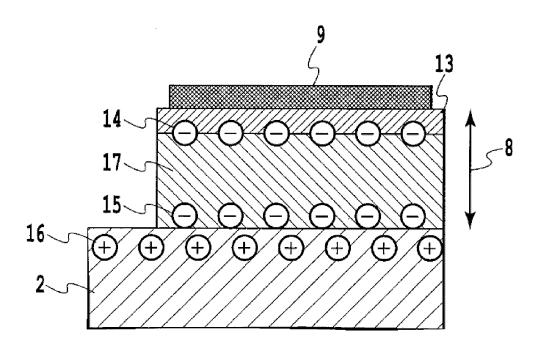


FIG. 4

Inventors: Toshiko Makimoto, et al. Docket No.: 14321.63 NEW SHEET

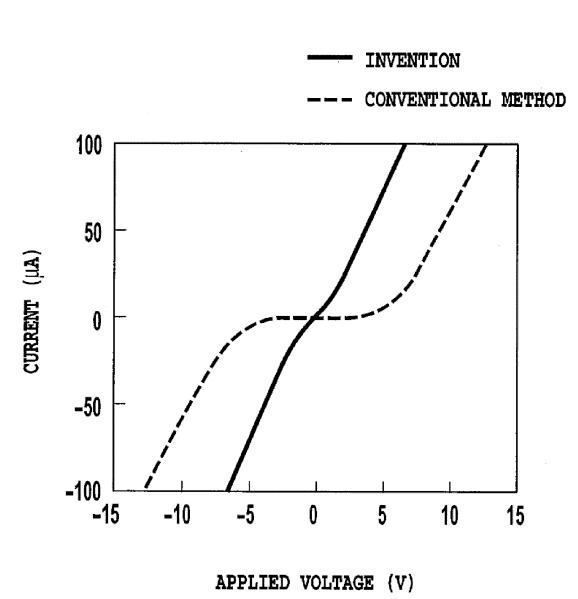
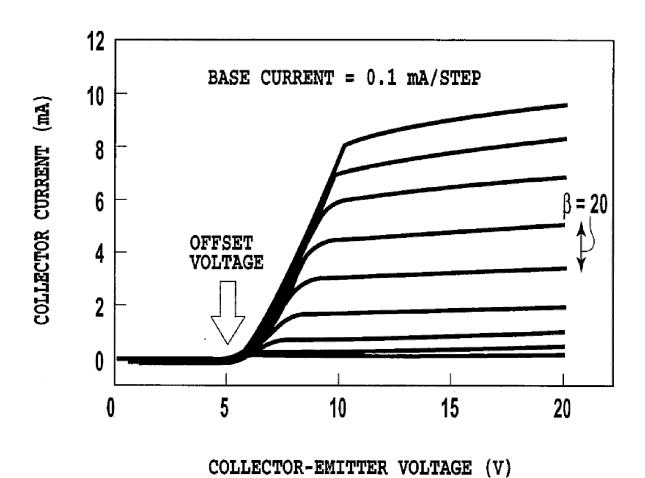


FIG. 5

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PRIOR ART FIG. 6

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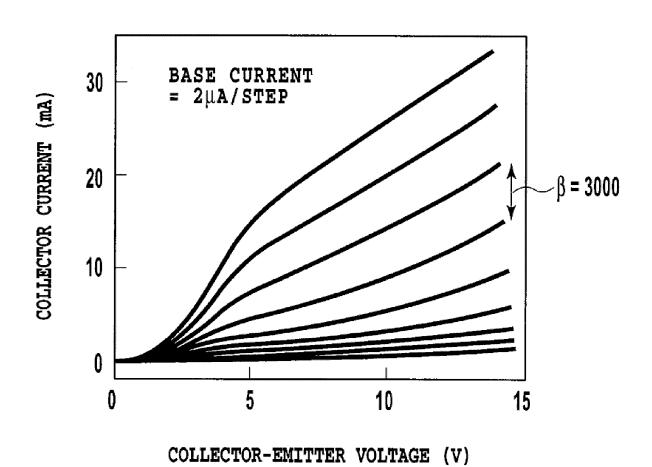


FIG. 7

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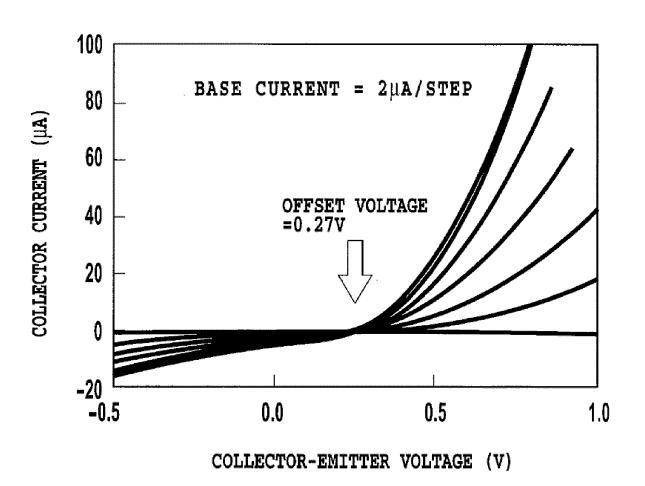


FIG. 8

FIG.9A PRIOR ART

CRYSTAL GROWTH OF HBT STRUCTURE

FIG.9B PRIOR ART

SURFACE EXPOSURE OF BASE LAYER BY ETCHING

FIG.9C PRIOR ART

SURFACE EXPOSURE OF SUB-COLLECTOR LAYER BY ETCHING

FIG.9D PRIOR ART

21:n-TYPE GaN EMITTER LAYER

22:p-TYPE INGAN BASE LAYER

23:n-TYPE COLLECTOR LAYER

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25:p-TYPE, ELECTRODE

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NEW SHEET

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Inventors: Toshiko Makimoto, et al.

FORMATION OF D-TYPE ELECTRODE ON BASE LAYER

FIG.9E PRIOR ART

FORMATION OF N-TYPE ELECTRODES ON EMITTER LAYER AND SUB-COLLECTOR LAYER

21:n-TYPE GAN EMITTER LAYER

22:p-TYPE INGAN BASE LAYER

24:n-TYPE SUB-COLLECTOR LAYER

21:n-TYPE GAN EMITTER LAYER

22:p-TYPE INGAN BASE LAYER

23:n-TYPE GAN EMITTER LAYER

21:n-TYPE GAN EMITTER LAYER

21:n-TYPE GAN EMITTER LAYER

22:p-TYPE INGAN BASE LAYER

23:n-TYPE GAN EMITTER LAYER

24:n-TYPE GAN EMITTER LAYER

24:n-TYPE GAN EMITTER LAYER

24:n-TYPE SUB-COLLECTOR LAYER

24:n-TYPE SUB-COLLECTOR LAYER

26:n-TYPE ELECTRODE 25:p-TYPE ELECTRODE VELECTRODE 26:n-TYPE 24:n-TYPE SUB-COLLECTOR LAYER 24:n-TYPE SUB-COLLECTOR LAYER 21:n-TYPE GaN EMITTER LAYER 23:n-TYPE COLLECTOR LAYER 22:p-TYPE INGAN BASE LAYER

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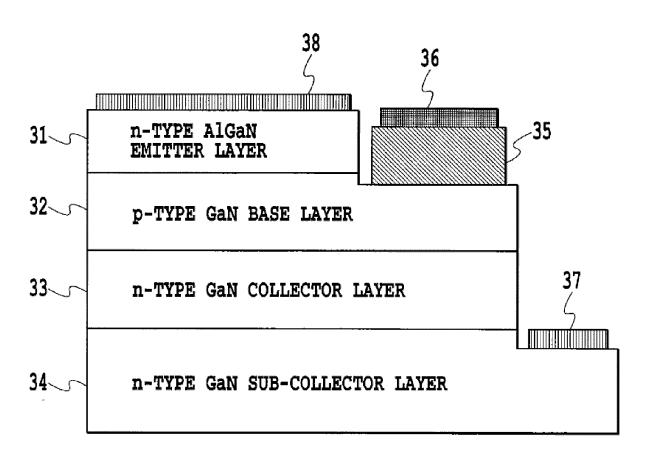


FIG. 10